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Lennart Olsson

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EXAMINER

BROWN II, DAVID N

ART UNIT

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1791

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,034	Applicant(s) OLSSON ET AL.	
	Examiner DAVID N. BROWN II	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/10/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 15, 16, 19, 20, 25, 26, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,377,377 Arends in view of US 4,450,201 (Brill).

In regards to claims 15-16, 19, and 26, Arends discloses a thermoforming machine with two opposing platens driven by a motor toward and away from each other. With respect to the apparatus in figure 2, part 20 is a contacting means with an attached alignment means. Part 28 (or 30) in connection with part 32 serves as alignment means by securely and precisely attaching part 20 to rail 14 thus preventing unwanted horizontal movement of the contacting means (Column 2 line 66). Adjustment of bar 28 by means of part 32 causes platen 20 to be aligned horizontally. Therefore Arends demonstrates in figure 2 elements 28 and 30 used for alignment of the assemblies on

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the posts. Take note of pressing means 42 and 44, and stamps M1 & M2, each having a 1st pattern and 2nd pattern, respective, which are connected to the contacting means. Also, assemblies 28 and 30 are adapted to move in the pressing direction. In Figure 2 the stationary base is designated 10 and the vertical posts are designated 14, 16, and 18. The rail is both stationary and supported by bases 12 and 10. Also, assemblies 28 and 30 are adapted to move in the pressing direction. According to the drawings, assemblies 28 and 30 are attached to both contacting means 20 and 22 thus addressing applicant claim 16.

With regard to applicant claim 17, in the drawings, assemblies 28 and 30 are attached both to a rail and to the contacting means, where these assemblies protrude from the contacting means. Being shaped as vertical bar-like structures, assemblies 28 and 30 are both arms. Arends possesses a thermoforming apparatus therefore a heating means is inherent, addressing applicant claim 19.

Regarding claims 20, 25, 31, and 32, the workpiece in Arends et al appears to be a polymeric material. In any event, the apparatus of Arends et al is taken also capable of thermoforming a thermoplastic polymeric sheet. It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the operating temperature of a thermoforming apparatus such as that described by Arends, to form a pattern in the workpiece. All that would have been needed is to ensure that the softening temperature of a polymer is less than a maximum operating temperature of Arends et al's device. Regarding applicant claim 26, the abstract of the Arends patent discloses that the cam is motor-driven, thus mechanically operating the apparatus.

Regarding claims 29-30, for the same reason set forth above, the limitations in these claims are taken to be anticipated by Arends et al.

3. Arends does not teach the use of a heat transmission barrier. Brill teaches in column 1 lines 18- 23 that heat transmission barriers have been used to increase heating efficiency by preventing radiation loss. Both documents, therefore are dedicated to the solution of a common problem: the focus on heat to accomplish a goal. It would have been obvious to one having ordinary skill in the art at the time of the invention to use a heat transmission barrier in the thermoforming apparatus of Arends motivated by the desire to prevent heat loss.

4. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication 2001/0029714 (Lynch) in view of US Patent No. 4377,377 (Arends) and Brill.

The prior art provides for heating in this thermoforming apparatus as previously discussed. It would have been obvious to one having ordinary skill in the art to operate at a lower temperature motivated by the desire to use different materials. A device able to heat to 450 degrees could reasonably be adapted to operate at a lower temperature.

5. Claims 15-21 and 24-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication 2001/0029714 (Lynch) in view of US Patent No. 4377,377 (Arends) and Brill.

With respect to claim 15, Lynch teaches a device for creating a two-sided pattern to a two-sided object by way of using two stamps (Lynch, claim 14). The object is

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pressed between two molds in order to create the pattern. The object is pressed between two molds in order to create the pattern.

Lynch is silent on a system for securing and cyclically moving the pair of opposing molding platens to a pressing position and a open position. In particular, Lynch does not teach an alignment means arranged in connection with the first contacting means for controlling the motion of the first stamp in a direction perpendicular to the pressing direction. However, Arends addresses these issues in figure 2. The discussion of the Arends patent in numbered paragraph 6 is incorporated herein. Arends and Lynch provide similar teachings on molding an object. It would have been obvious in the art to incorporate the thermoforming system of Arends et al to a stamping apparatus suggested by Lynch et al in order to allow for flexibility in a molding operation "without imposing any undue loading on any components of the drive system (col. 1 lines 36-44) and also to provide accurately and precisely positioned opposing imprint to a fiberboard. All that would have been needed is to incorporate the pair of imprinting platens of Lynch et al into the system taught by Arends et al.

With respect to claims 16, 17, 26, 29, and 30, see the discussion of the Arends et al patent in numbered paragraph 6 above.

With respect to claims 19-21, Lynch also discloses: "Upon molding in a heated press at a temperature in the range of about 385.degree. F. to 450 degrees F... [0034]" This section of the prior art demonstrates that a means is arranged to heat the substrate to the predetermined temperature which falls within a temperature range of up to 500 °C since a person having ordinary skill in the art

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would round 450 to 500 when reporting one significant figure. In any event, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the operating temperature to correlate to the softening temperature in a thermoforming process. As for claim 21, it would have been obvious in the art to provide a temperature sensor for monitoring a temperature of a workpiece in the device taught by Lynch in order to prevent the workpiece from being under or over heated.

With respect to claim 24, the specification fails to define positively the dimension of patterns which are embraced by the limitation microstructures. For this reason, it is reasonably assumed that, patterns having 100-500 microns are embraced by microstructures. Since it is desired in Lynch et al to transfer pattern to a fiberboard having a high fidelity and "sharp, crisp design detail" (abstract; paragraph number 0003), it would have been obvious in the art to form a pair of stamps in Lynch such that the dimension of the patterns ranges from .1-.5 mm (100-500 micron) in order to form a door panel having intricate decorative details. For these reasons it would have been obvious to one having ordinary skill in the art at the time of the invention to combine the device described by Arends with the method described by Lynch.

With respect to claims 27-28, while it is expressly stated, it would reasonable to expect that the contacting means (20), which is characterized by Arends et al to be a platen, is metallic. In any event, such would have been obvious in the art in order to provide needed structurally strength and integrity which are needed for effective cyclic molding operation. Additionally, it would have been obvious in the art to cover the

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contacting means having a stamper with a thermal insulating material in order to reduce loss of heat during a molding operation thereby reducing energy cost of production.

6. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lynch, Arends and Brill as applied to claim 15 as above, and further in view of US Patent 6,325,609 (Shimada).

Lynch, Arends and Brill do not teach using a pressure sensor for monitoring the pressure of the process. Shimada patent discloses a compression molding machine with a pressure detecting means (claim 1). There is also a pressure detector which can be calibrated to deliver the same amount of pressure with each compression. Lynch discloses specific pressure limits embodied by [Lynch's] method. In order to ensure those limits are achieved, a pressure sensor would be required in order to measure the pressure and a pressure control would be required to maintain the pressure according to the method. As a result of this information, it would have been obvious to one having ordinary skill in the art at the time of the invention to use a pressure sensor including a control unit in order to detect or control the pressure of the process so that a desired pressure can accurately and precisely be exerted on the workpiece during pressing operation.

Response to Amendment

7. Applicant has amended claims 15 and 29 to include the limitation of “micro and nanostructures”. This amounts to increasing the resolution of the imprinting method of the combined invention. As a result of this amendment, the examiner concludes that the differences between the amended claim and the combination presented by the

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examiner amount to a change in size only. This is not considered to be patentably significant. *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955) (Claims directed to a lumber package "of appreciable size and weight requiring handling by a lift truck" where held unpatentable over prior art lumber packages which could be lifted by hand because limitations relating to the size of the package were not sufficient to patentably distinguish over the prior art.); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) ("mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled." 531 F.2d at 1053, 189 USPQ at 148.). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

8. Evidence that the technology existed at the time of the invention to scale down the size of the pattern is supplied in US 2003/0219992 (Schaper) which was published more than one year prior to the filing of applicant's application. Shaper teaches "One example of these novel technological patterning paradigms is nanoimprint technology. In nanoimprint techniques, a master pattern is formed by a high resolution patterning technique, such as E-beam lithography. These high resolution masters are then used to create a corresponding pattern on the IC layer without the use of an imaging step, but with some kind of stamping or printing technique. This is in principle very similar to

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techniques used for creating the microscopic patterns found on compact discs (CDs).

[0008]" Thus a stamping or imprinting method for transferring patterns having a resolution in the micro and nano ranges was known at the time of the invention. From this, the examiner concludes that the limitations added to the claims amount to a changing of size of the patterns and that patterns of this size were known in the art at the time of the invention. Thus the differences between the amended claim and the prior art combination are not patentably distinct.

Response to Arguments

1. Applicant's arguments filed 06/06/2009 have been fully considered but they are not persuasive.
2. Applicant's argument that there is no suggestion in Arends that a heat barrier would be desirable and that the disclosed heat barrier in Brill would be suitable for the device in Arends has been considered but it is not persuasive. Because Arends teaches the use of a thermoforming device, heat is used to deform the imprinted material. Therefore Arends intends to apply heat to the workpiece. This means that Arends is directing heat toward the workpiece. Brill teaches that heat transmission barriers increase heating efficiency and prevent heat loss. Since Arends directs heat toward the workpiece, and Brill teaches a method to improve heating efficiency, one having ordinary skill in the art would recognize that the heat barrier of Brill would allow the practitioner of Arends to direct heat to the workpiece with a greater efficiency. Thus both Arends and Brill work on the common problem of directing heat to the workpiece and are properly combinable. A heat transmission barrier would be thus desirable in the

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invention of Arends because it would assist in directing the heat toward the workpiece. Applicant also asserts that the disclosed heat barrier of Brill may not be suitable in the device of Arends. The examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). The teachings of the prior art suggest that efficiency could be increased by including the heat transmission barrier of Brill in the device of Arends would increase efficiency.

9. Applicant's argument that the references, Arends, Brill, and Lynch do not disclose the limitation of "transferring micro- and nanostructures to an object" has been considered but it is not persuasive. The new limitation only amounts in a change in size of the known patterning devices disclosed in the prior art. Since resolutions of that size were known in the prior art at the time of the invention, this amounts to using known methods to accomplish a result and is therefore not patentable over the prior art.

10. Applicant's argument that Arends does not disclose "a first stamp adapted to imprint a first pattern in the first surface of the object" has been considered but it is not persuasive. Arends teaches "However, the time period during which the platens must remain in their mold closed position to form the article can vary considerably depending upon the material and type of article being formed, and the rate of closure of the mold platens, particularly in plug assist operations, likewise must be capable of variation. For

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example, when forming egg cartons from a foamed material, too rapid a closure of the mold platens will cause the plugs to crack the material, and the foamed material requires a longer mold closed dwell than might be required, for example, for the formation of a styrene cup. (column 6 line 59- column 7 line 2)" When mold carrying platens that form an article into an egg carton an imprinting process has taken place. The egg carton shape is the pattern in the surface of the object. The action of the mold carrying platens is a closing of a pattern containing mold over an object. This is an imprinting process.

11. Applicant's argument that there is no suggestion in Lynch that a heat barrier would be desirable has been considered but it is not persuasive. The same reasoning applies here that applies to the argument against the combination of Arends and Brill. A heat transmission barrier would increase efficiency of the process. Also the prior art suggests that an increase in efficiency would be obtained as a result of this combination.

12. Applicant's argument that Arends does not disclose an alignment means as according to applicant claim 15 has been considered but it is not persuasive. A linkage "which enables the time during which the mold platens are closing or are held in the closed position to be adjusted" is an alignment means. Adjusting is aligning. As stated before Arends prevents unwanted horizontal movement of the contacting means (Column 2 line 66). Arends teaches that adjustment of bar 28 by means of part 32 causes platen 20 to be aligned horizontally.

13. Applicant's argument that the alignment means of Arends would not address the alignment of patterns on the micro or nano scale because of the differences in size between the application and the prior art has been considered but it is not persuasive. The differences between the application and the prior art amount to a size difference. This has been held to be a minor and unpatentable difference. It was known at the time of the invention to perform nanoscale imprinting. It was also known at the time of the invention to adjust the imprinting means.

14. Applicant's argument that the dependant claims are allowable has been considered but it is not persuasive. The claims are still rejected for the reasons set forth above.

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID N. BROWN II whose telephone number is (571)270-5497. The examiner can normally be reached on Monday-Thursday 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571)-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID N. BROWN II/
Examiner, Art Unit 1791

/Joseph S. Del Sole/
Supervisory Patent Examiner, Art Unit 1791